Matrix Logic and Venn Diagram Packet Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_\_\_\_\_\_

Score \_\_\_\_\_\_\_\_\_/25

**Matrix Logic**

Logic is a thought process which follows some type of reasoning. The thinking may be valid or invalid. It may be based on facts or assumptions. As a result, the logic may result in true or faulty conclusions. One of the objectives of this course is to help the students think with valid logic and draw true conclusions.

Deductive reasoning can be used in problem solving situations. One method of solving problems uses a table. This method is called matrix logic.

The definition of a matrix is a rectangular arrangement of numbers in rows and columns. For purpose of matrix logic, those rows and columns should have headings. Matrix logic is the use of a matrix to solve a logic problem.

Use logic to solve the problem below.

Six students attended a class party and ate a variety of foods. Something caused them to become ill. John Q. Public ate pizza, hamburgers, and tacos and became ill. Homer T. Odyssey ate hamburgers and tacos but not pizza. He became ill. L.J.Horner ate pizza but neither hamburgers nor tacos and felt fine. L.B. Peep didn’t eat anything and also felt fine. J.Spratt ate pizza and tacos but no hamburgers and became ill. James T. Kirk ate hamburgers and tacos but stayed away from the pizza. He also got sick.

Make a table to organize your information. You might use the heading given below for your table. Then determine the food that probably caused the illness.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Ate hamburgers? | Ate pizza? | Ate tacos? | Became ill? |
|  |  |  |  |  |

**Solve the matrix logic problems on the back of this paper. Number 2 has been done for you as an example.**

**LOGIC PROBLEMS**

The following problems can be solved by eliminating possibilities. It may be helpful to use charts such as the one shown in the first problem. Mark an X in the chart to eliminate a possible answer.

**Solve each problem.**

1. Nancy, Olivia, Mario, and Kenji each have one piece of fruit in their school lunch. They have a peach, an orange, a banana, and an apple. Mario does not have a peach or a banana. Olivia and Mario just came from class with the student who has an apple. Kenji and Nancy are sitting next to the student who has a banana. Nancy does not have a peach. Which student has each piece of fruit?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Nancy | Olivia | Mario | Kenji |
| Peach |  |  |  |  |
| Orange |  |  |  |  |
| Banana |  |  |  |  |
| Apple |  |  |  |  |

1. Victor, Leon, Kasha, and Sheri each play one instrument. They play the viola, clarinet, trumpet, and flute. Sheri does not play the flute. Kasha lives near the student who plays the flute and the one who plays trumpet. Leon does not play a brass or wind instrument. Which student plays each instrument?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Viola | Clarinet | Trumpet | Flute |
| Victor |  |  |  |  |
| Leon |  |  |  |  |
| Kasha |  |  |  |  |
| Sheri |  |  |  |  |

1. Mr. Guthrie, Mrs. Hakoi, Mr. Mirza, and Mrs. Riva have jobs of doctor, accountant, teacher, and office manager. Mr. Mirza lives near the doctor and the teacher. Mrs. Riva is not the doctor or the office manager. Mrs. Hakoi is not the accountant or the office manager. Mr. Guthris went to lunch with the doctor. Mrs. Riva’s son is a high school student and is only seven years younger than his algebra teacher. Which person has each occupation?
2. Yvette, Lana, Boris, and Scott each have a dog. The breeds are collie, beagle, poodle, and terrier. Yvette and Boris walked to the library with the student who has a collie. Boris does not have a poodle or terrier. Scott does not have a collie. Yvette is in math class with the student who has a terrier. Which student has each breed of dog?